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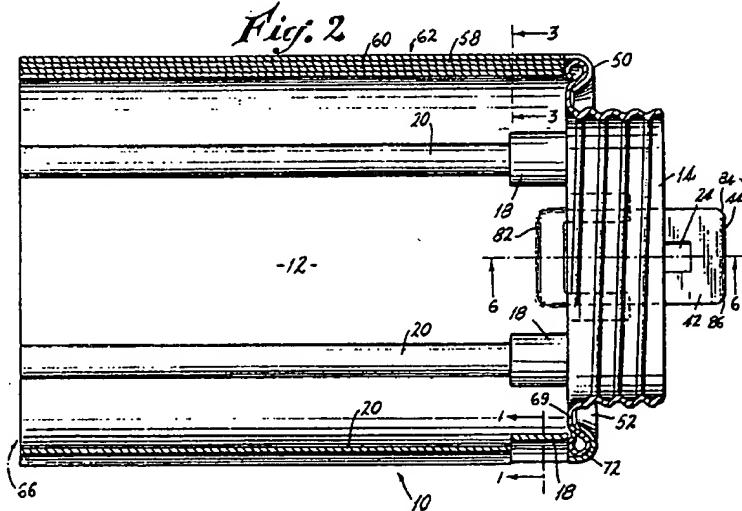
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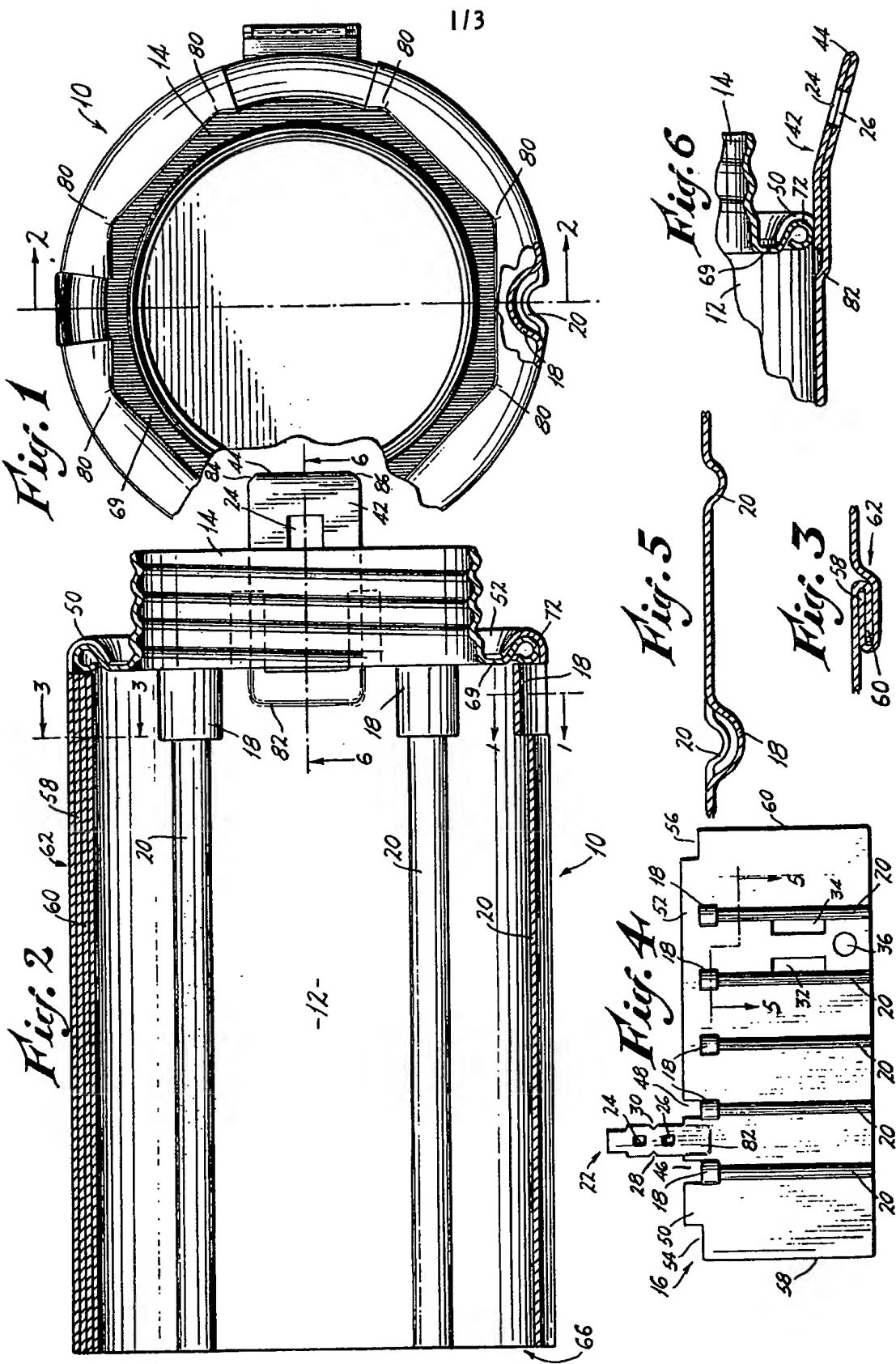
(54) Composite Clamping Shell for Electric Cigar Lighters

(57) A clamping shell (10), for securing a socket part of an electric cigar lighter in a dashboard or other panel, comprises a rolled sheet-metal body (12) of tubular configuration, having open ends and a reverse-bend clinched seam (62) extending longitudinally between its ends; and a drawn sheet metal sleeve (14) having an annular configuration with a rolled screw thread in its wall to receive the socket part, one end of the sleeve (14) having an out-turned flange (69) that is received in the one end of the body (12) in abutment with stop shoulders (18); edge portions (50, 52) of the one end of the body (12) being laid over the flange (69) of the threaded sleeve to retain it on the body. The composite shell can be constituted of pre-plated stock. A spade lug 42 is formed integrally with the body (12).

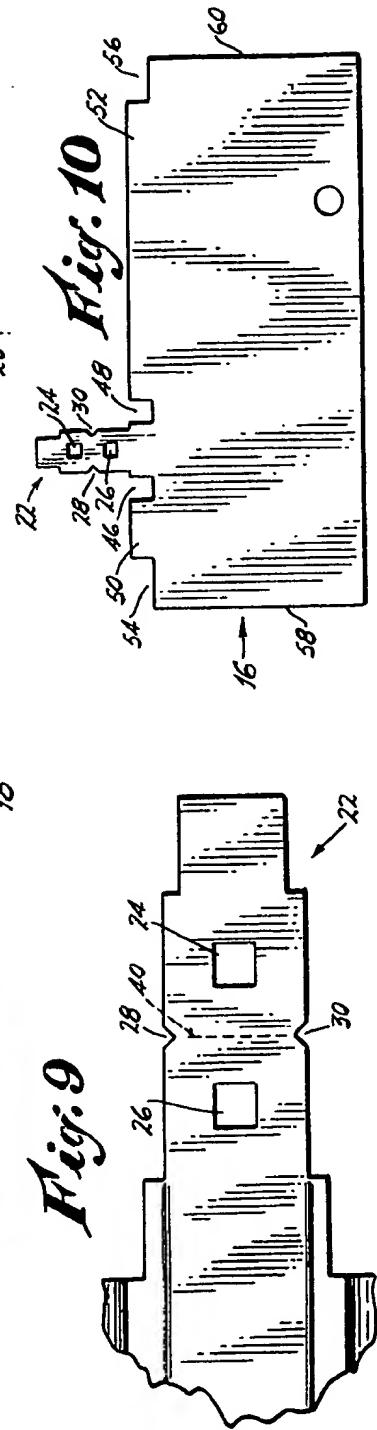
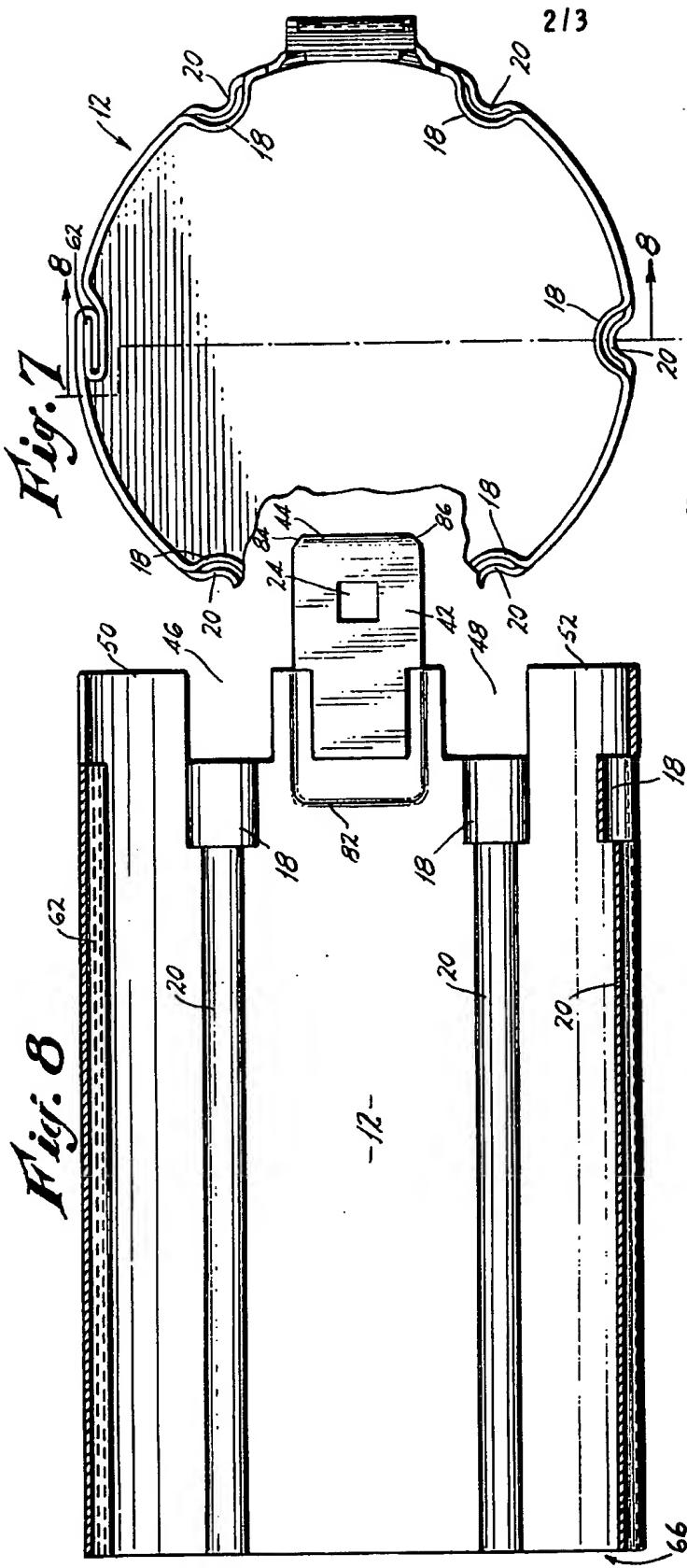


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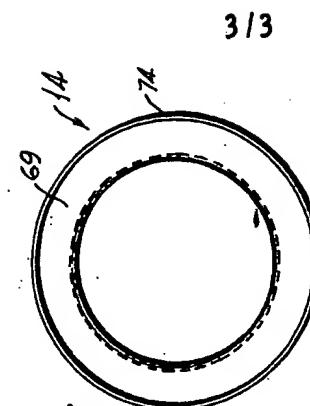
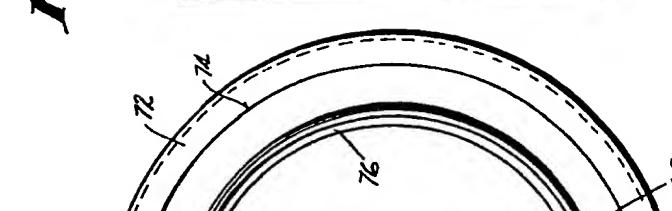
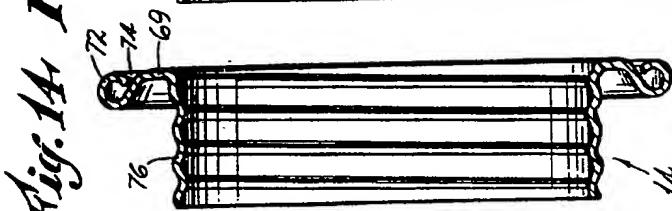
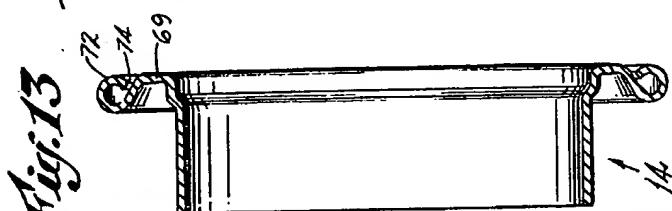
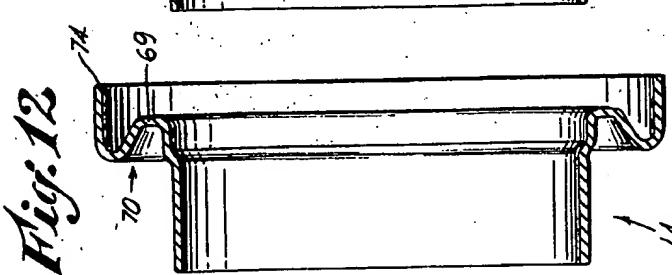
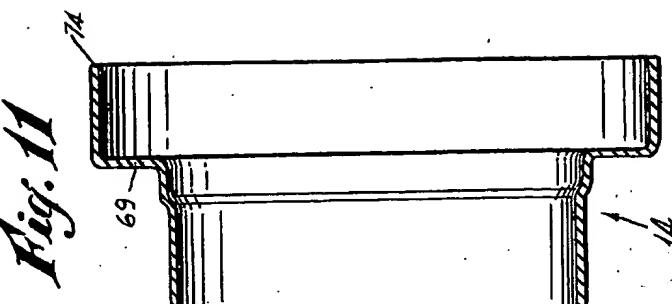


Fig. 16

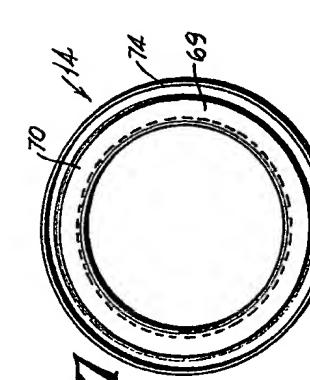


Fig. 17

SPECIFICATION

Composite Clamping Shell for Electric Cigar Lighters

This invention relates generally to electric cigar lighters of the type employed in automobiles or other motor vehicles, and more particularly to lighters of the type incorporating a socket part that is mounted in a dashboard or other panel, and a removable plug part that carries an electric heating element.

Many different constructions involving electric cigar lighters of the above type have been developed over the years. Generally, the socket of the lighter device had an out-turned flange of bezel at its front, and was inserted through a hole in the dashboard or panel, being held captive therein by a tubular clamping shell that was screwed onto the socket from the rear, behind the dashboard. The front edge of the clamping shell engaged the rear surface of the dash, and held the socket in position. That is, the dashboard or panel was sandwiched between the out-turned flange of the socket and the front edge of the clamping shell.

Most of the older model automobiles employed metal panels, and thus one part of the cigar lighter circuit was established from the metal part of the socket to the panel and ground. With the advent of newer car models involving both cost and weight reduction, plastic panels and bezels are now being employed to a far greater extent. This generally necessitates the use of a grounding terminal or lug of some type, in electrical contact with the metal shell or body part of the socket. Previously, the electrical contact to this part was made by means of a spade lug that was welded to the clamping shell, and which was received in a cooperable grounding terminal from the vehicle electrical system. Since the clamping shell, being constituted of metal, was in electrical contact with the socket, there existed the required continuity for the ground circuit.

Several problems have occurred, however, with regard to the welding of a lug onto the clamping shell, the most important including lack of a reliable test for integrity of the weld, and failure of the weld at some time during the subsequent life of the component or shell. Generally both the socket and shell are plated in order to avoid deterioration from moisture, particularly where the devices are disposed in the arm rests of the doors of the vehicle. Often these devices would become wet if a window of the vehicle was inadvertently left open during a storm, or where the vehicle was exposed to a corrosive industrial or salt atmosphere. In the past, when it was required to fasten an electrical connector in the form of a spade lug to the clamping shell, it has been customary to plate the part after the fastening operation, since the welding disturbed any pre-existing plating. But, under any circumstances, the welding step was time consuming, involving manual labor, and this, as well as the plating of finished parts, represented

65 an additional expense. With the impact of the continually rising labor costs represented by the above, the clamping shell started to become a product that was cost-prohibitive and no longer economical to produce in the environment of the electrical cigar lighter.

70 The above disadvantages and drawbacks of prior clamping shells for automobile cigar lighters are obviated by the present invention, which provides a composite clamping shell for electric cigar lighters, comprising in combination a rolled sheet-metal body of tubular configuration, having open ends and a reverse-bend clinched seam extending longitudinally between its ends; said body having a plurality of inwardly-displaced stop shoulders adjacent one end and spaced circumferentially apart, said stop shoulders being spaced inwardly from the edge of said one end, a drawn, sheet metal sleeve of annular configuration, having a rolled screw thread in its wall, one end of said sleeve having an annular, out-turned flange which is received in the said one end of the sheet-metal body in abutment with said stop shoulders, the edge portions of said one end of the sheet-metal body being laid over the flange of said threaded sleeve to retain the latter on the body.

75 The invention further provides a composite, clamping shell for electric cigar lighters, comprising in combination a rolled sheet-metal body of tubular configuration, having an open end adapted to engage the rear surface of an apertured panel in an automobile, adjacent the location of a mounting flange for a threaded cigar lighter socket, a sheet metal sleeve of annular configuration, having a screw thread in its wall,

80 cooperable means joining said sheet metal sleeve to the other end of the sheet-metal body, and for preventing relative rotation between the two parts such that the sleeve thread can mate with the cooperable thread on the cigar lighter socket and

85 thereby hold the latter captive in the aperture of said panel, and an electrically conductive spade lug integral with the sheet-metal body so as to be at substantially the same electrical potential thereof at all times, said spade lug being adapted

90 for connection to a cooperable electrical connector of the electrical system of an automobile for carrying electrical current between said electrical system and said cigar lighter socket.

95 The invention still further provides a method of making a composite clamping shell for an electric cigar lighter, which comprises the steps of blanking out a flat substantially rectangular blank from commercial grade sheet metal, laterally displacing a plurality of stop-shoulder portions along and spaced inwardly from one end of the blank, rolling the blank into a cylindrical shape and forming the adjoining edges into an interlocking, tightly crimped seam to secure said

100 edges to each other, deep-drawing a sheet metal shell of annular configuration and having an out-turned annular flange at one end, rolling a thread in the walls of said shell, placing the flange of the shell into one end of the cylindrically-shaped

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blank against the stop-shoulder portions thereof, and laying over onto said flange edge portions of the said one end of the cylindrically-shaped blank to secure the threaded shell thereto.

5 Other features and advantages will hereinafter appear.

In order that the invention may be more readily understood, reference will now be made to the accompanying drawings, in which:

10 Fig. 1 is a view, partly in end elevation and partly in section, illustrating the composite clamping shell.

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

15 Fig. 3 is a fragmentary section taken on the line 3—3 of Fig. 2.

Fig. 4 is a plan view of a blank or stamping employed to fabricate the body of the shell, shown prior to its formation into a cylindrical shape, and having various structural features imparted thereto, this view being similar to that of Fig. 10, which shows the stamping prior to such processing.

Fig. 5 is a fragmentary section taken on the line 25 5—5 of Fig. 4.

Fig. 6 is a fragmentary section taken on the line 6—6 of Fig. 2.

Fig. 7 is a right end elevation of the tubular body of the composite shell, showing various 30 details of the construction.

Fig. 8 is a section taken on the line 8—8 of Fig. 7.

Fig. 9 is a fragmentary view of a projection that is formed integrally with the blank of Fig. 4, this 35 projection being adapted for folding back upon itself to form a spade lug.

Fig. 10 is a plan view showing the body of the shell just after stamping or blanking from a piece of substantially flat sheet-metal material (not 40 shown).

Fig. 11 is a vertical section of the sleeve portion of the composite clamping shell, during a first step in its formation wherein it is drawn into the configuration illustrated from a substantially 45 flat blank of material (not shown).

Fig. 12 is a view like that of Fig. 11, but illustrating a further step in the formation of the sleeve.

Fig. 13 is a view like that of Fig. 11 but 50 illustrating a still further step in the formation of the sleeve.

Fig. 14 is a view like that of Fig. 11 but showing the final step in the formation of the sleeve, wherein a portion thereof has had 55 imparted to it a rolled thread formation.

Fig. 15 is a right end elevational view of the sleeve of Fig. 14.

Fig. 16 is a right end elevation of the sleeve as it appears in Fig. 11, but on a reduced scale.

60 Fig. 17 is a right end elevation of the sleeve as it appears in Fig. 12, also on a reduced scale.

Referring to Figs. 1 and 2, there is illustrated a cigar lighter clamping shell designated generally by the numeral 10, which in the present instance 65 is constituted as two separate parts, a tubular

body 12 shown in Fig. 8 and a sleeve 14 illustrated in Fig. 14.

The tubular body 12 is initially stamped from a blank of flat, sheet-metal stock which can 70 optionally be pre-plated or pre-coated on both sides, the stamping having the form illustrated in Fig. 10 and designated by the numeral 16.

Following the initial stamping operation, there is imparted to the stamping 16 a series of laterally 75 extending projections 18, which can take the form of five inwardly lanced lugs, constituting positioning or stop shoulders. In addition, there is formed in the stamping 16 a series of longitudinal strengthening or stiffening ribs 20, shown here as 80 being five in number, which minimize any tendency for the stamping to deform as it is being further processed.

Also, there is formed on the stamping a projecting lug 22 having two generally square or 85 rectangular apertures 24, 26 and a pair of notches 28, 30 located on opposite sides of the lug 22, which facilitate bending of the lug back upon itself, as will be explained below. Apertures 32, 34 are also provided in the stamping 16,

90 being rectangular as shown and adapted to receive mountings of a housing (not shown) for a lamp which is intended to provide illumination to the socket of the cigar lighter. Such lighting is desirable for replacement of the cigar lighter plug 95 following its use, under dark conditions. The circular hole 36 is intended to be aligned with the filament of an incandescent bulb (not shown), to provide the desired illumination. Since the housing and bulb per se form no part of the 100 present invention, they have been omitted from the drawings in the interest of simplicity and clarity. Such housings that are associated with the clamping shell, and used for illumination of the socket of a cigar lighter device are old and well known in the art.

As can now be understood, the stamping 105 operation which produces the blank 16 of Fig. 4 can also provide the structural features or embossings illustrated in Fig. 4 all the same time, that is, simultaneously with one another, depending on the nature of the dies that are available or are being employed.

Fig. 9 illustrates an enlarged view of the 110 projection 22, showing the holes 24, 26 and the notches 28, 30.

Following completion of the stamping 115 operation, the stamped part will appear as in Fig. 4. The projection 22 is folded back upon itself along the dotted line 40 shown in Fig. 9, such that 120 the outer end of the projection rests on the side of the stamping having the stops 18, with the holes 24, 26 in registration with one another. This step accomplishes several objectives. The projection 22 is formed into a double thickness of material, 125 that is, it consists of two layers of superposed metal, providing increased strength and rigidity which has been found to be important, as will be pointed out later. Second, with the holes 24, 26 overlying one another, they provide a single 130 recess which is adapted to receive a bead (not

shown) on a cooperable electrical connector extending from the electrical system of the vehicle with which the cigar lighter is to be used. As illustrated in Fig. 6, the projection 22, when 5 folded back in this manner, constitutes a spade lug 42 having a folded leading edge 44 which also facilitates installation of the cooperable electrical connector.

Referring again to Fig. 4, the stamping has two 10 additional cut-outs 46, 48 which are disposed on opposite sides of the projection 22 and which provide clearance for edge portions 50, 52 of the stamping 16 when the composite clamping shell 10 is assembled, as will be explained below. Also, 15 additional cut-outs 54, 56 are provided to enable the stamping in Fig. 4 to be readily formed into the necessary, substantially cylindrical or tubular shape as illustrated in Fig. 8, with the longitudinal edges 58, 60 being joined to one another by 20 means of a clinched seam 62 particularly illustrated in Fig. 3, and also shown in Fig. 2, extending for substantially the entire length of the tubular shaped structure 12 (hereinafter also referred to as a rolled sheet-metal body of tubular 25 configuration). The end of the seam 62 extends radially inward of the cylindrical surface formed by the body 12 and is substantially aligned with the corresponding ends of the projections 18, thus constituting a sixth positioning or stop 30 shoulder for the sleeve 14 as will be explained below. In Fig. 8, the left end of the body is seen to be open at 66, and adapted to engage the rear surface of a dashboard or panel in which the cigar lighter device is to be installed.

Referring now to Figs. 11—17 there is 35 illustrated the other part of the composite clamping shell, this other part being in the form of a drawn, sheet metal sleeve of annular configuration. Figs. 11—14 show various steps in 40 the formation of the sleeve 14. The cup of Fig. 11 is drawn from a substantially flat blank of sheet metal. In Fig. 12, there has been imparted to the out-turned flange 69 of the component 14 a reverse bend 70, after which the outer periphery 45 is curled over at 72 in such a manner as to conceal the sharp edge 74. Following this step, the part 14 is placed in a machine (not shown) which rolls a thread formation into one end, as at 76. The threads 76 have the same pitch as and 50 are adapted to mate with cooperable threads on the end of the cigar lighter socket (not shown) with which the clamping shell is to be employed. The bend 70 and curl 72 are part of the out-turned flange 69 on the sleeve 14. Figs. 15—17 55 show various views of the sleeve 14 during its formation.

Referring now to Figs. 2, 8 and 14, the assembly of the sleeve 14 to the tubular body 12 can be readily understood. The sleeve 14 is 60 positioned with its out-turned flange 69 facing the body 12, and the flange is inserted in the open right end of the body (Fig. 8) until the flange 69 engages the stop shoulders 18, and also the end of the clinched seam 62 which likewise acts as a 65 stop. The edge portions 50, 52 of the end of the

body are then curled over the flange 69 of the sleeve, resulting in the structure of Fig. 2 being evolved. As pointed out previously, clearance notches 46, 48 are provided to enable the curling

70 operation to be carried out without encountering interference with the spade lugs 42. As illustrated in Fig. 6, the edge 50 of the body that is curled over is shown in elevation. Following the curling or laying over of the edge portions 50, 52, the 75 sleeve 14 is held captive in the body. In order to insure that there is no relative movement between the sleeve 14 and the body 12, a series of dimpled formations are imparted to the roller over edge portions 50, 52, such dimpled 80 formations being eight in number and designated by the numeral 80. The dimpling operation can be readily performed with a suitable octagonal shaped punch, which deforms the rolled over edge portions, as well as the curl 72 of the sleeve, 85 thereby insuring tight engagement between the two parts and minimizing the possibility of relative movement therebetween; such movement would be undesirable since during assembly of the clamping shell to the cigar lighter 90 socket, a certain amount of torque is applied to the threaded portion 76, while the body 12 is being held stationary (also by its engagement with the rear surface of the dashboard, bezel, etc.).

95 Further, the inner layer of the spade lug 42 is sandwiched between the outer layer of the latter and the curl 72 of the sleeve 14, as particularly illustrated in Fig. 6. Such a construction has been found to provide additional stiffness and strength 100 to the spade lug 42, minimizing the possibility of deformation thereof during handling or use. As shown in Fig. 6, the inner layer of the spade lug 42 lies generally in the same cylindrical surface as the remainder of the body 12, whereas the outer 105 layer of the lug lies outside the confines of the body. The lug 42 may optionally be bent at a slight angle in a radially outward direction as shown in Fig. 6, to facilitate installation of the electrical connector that mates with it. The 110 present construction also gives rise to a small shoulder 82 having reverse bends at the juncture of the lug 42 and remainder of the body 12. The shoulder 82 forms a recess into which the inner lamination or layer of the spade lug can nest while 115 still being sandwiched between the surface of the recess and the curl 72. This recess can be imparted to the body at the same time that the latter is stamped in its flat condition as in Fig. 4.

The folded edge 44 of the spade lug 42 has 120 bevelled corners, shown in Fig. 2 and designated 84 and 86, this again facilitating installation of the cooperable electrical connector. These corners are automatically imparted to the lug when it is folded back upon itself, by virtue of the 125 notches 28, 30 illustrated in Figs. 4 and 9. In addition, by providing notches in the projection 22 of Fig. 4, a line of weakness corresponding to the dotted outline 40 of Fig. 9 is established, thereby facilitating the subsequent bending 130 operation.

The above construction has a number of distinct advantages which are not found in the prior art devices. First, both of the component parts of the shell can be easily and quickly fabricated from substantially completely flat sheet-metal stock.

Second, no welding operations are required during the fabrication. There are thus eliminated any problems resulting from failure of the weld, or weld-testing procedures. This constitutes a distinct advantage, especially when one considers that it has been customary in the past to weld spade lugs onto the clamping shells of cigar lighter devices in order to complete the ground side of the circuit. The provision of the integrally formed spade lug 42 not only eliminates the necessity for welding and its consequent cost, but it also provides the required reliable electrical continuity in an extremely simple manner. The particular desired configuration for the spade lug can be determined at the time that the blank is stamped out, and modifications made if needed, at the time of stamping in order to suit different conditions of use. The unique arrangement whereby the laid-over edge portions of the tubular body are dimpled and deformed so as to improve the retention of the sleeve has been found to be a simple yet extremely effective means for insuring good mechanical and electrical connection between the body and sleeve. Problems with loosening of the sleeve are virtually completely eliminated. The cut-outs 54, 56 insure that no interference is encountered when the longitudinal clinched seam 62 is formed in the body. Similarly, the cut-outs 46, 48 reduce any likelihood of interference with the formation and subsequent utilization of the spade lug 42.

The present disclosure also embraces a method of making a composite, clamping shell for an electric cigar lighter, comprising essentially the steps of blanking out a flat, substantially rectangular blank 16 from commercial grade stock, laterally displacing multiple stop-shoulders 18 along and spaced inwardly from one end of the blank 16, rolling the blank 16 into a cylindrical shape 12 and forming the adjoining edges 58, 60 into an interlocking, tightly crimped seam 62, Fig. 3, so as to secure the edges together, deep-drawing a sheet-metal shell 14 of annular configuration and having an out-turned annular flange 69 at one end, rolling a thread 76 in the walls of the shell 14, placing the flange 69 of the shell into one end of the cylindrically shaped blank 12 against the stop-shoulder portions 18 thereof, and laying over onto the flange 69 the edge portions 50, 52 of the end of the blank 12 to secure the threaded shell 14 thereto.

The method further comprises the steps of dimpling, as at 80, the laid over edge portions 50, 52 of the cylindrically-shaped blank 12 so as to deform them and bring them into tighter engagement with the flange 69 of the sleeve 14.

The methods further include steps involved with providing stop-shoulders 18 on the blank 16, either during the stamping of the same or at

another time, imparting a series of longitudinal stiffening ribs 20 to the blank 16, forming the apertures 32, 34 and 36 for a lamp housing and lamp, forming the cut-outs 46, 48 and 54, 56 to

70 provide for the necessary clearance spaces during subsequent steps in the assembly of the composite shell, and finally the formation of the projection 22 which is adapted to be folded back upon itself so as to constitute the spade lug 42.

75 This forming of the projection 22 includes punching out the holes 24, 26 and the notches 28, 30 which establish a line of weakness such that the projection 22 can be folded back upon itself along this line, to form the said lug.

80 It can be seen that the device is both simple in its structure and economical to manufacture and mass produce, by virtue of the complete elimination of welding operations. In spite of its simplicity, it is especially rugged in use, and not

85 likely to become deformed during normal handling or installation.

The device is thus seen to represent a distinct advance and improvement in the technology of electric cigar lighters for automotive vehicles.

90 Each and every one of the appended claims defines an aspect of the invention which is distinct from all others, and accordingly each claim is to be treated in this manner when examined in light of the prior art in any determination of novelty or validity.

Variations and modifications are possible without departing from the spirit of the claims.

CLAIMS

1. A composite clamping shell for electric cigar

100 lighters, comprising in combination a rolled sheet-metal body of tubular configuration, having open ends and a reverse-bend clinched seam extending longitudinally between its ends, said body having a plurality of inwardly-displaced stop shoulders

105 adjacent one end and spaced circumferentially apart, said stop shoulders being spaced inwardly from the edge of said one end, a drawn, sheet metal sleeve of annular configuration, having a rolled screw thread in its wall, one end of said

110 sleeve having an annular, out-turned flange which is received in the said one end of the sheet-metal body in abutment with said stop shoulders, the edge portions of said one end of the sheet-metal body being laid over the flange of said threaded

115 sleeve to retain the latter on the body.

2. A composite clamping shell for electric cigar lighters as claimed in claim 1, wherein all portions of said rolled sheet-metal body are integral with one another.

120 3. A composite clamping shell for electric cigar lighters as claimed in claim 1, wherein all portions of said drawn, sheet metal sleeve are integral with one another.

125 4. A composite clamping shell for electric cigar lighters as claimed in claim 2, wherein said sheet-metal body is rolled from a substantially flat blank of sheet metal stock having embossed formations.

5. A composite clamping shell for electric cigar lighters as claimed in claim 1, and further including an electrical connector comprising a spade lug integrally formed with the rolled sheet metal body, for connection with a mating electrical connector of an automobile electrical system.

6. A composite clamping shell for electric cigar lighters as claimed in claim 5, wherein said spade lug comprises two layers of sheet metal, said lug being formed by folding back upon itself a projection on the body so as to present a folded edge at the extremity of the said lug.

7. A composite clamping shell for electric cigar lighters as claimed in claim 6, wherein said folded edge has beveled corners to facilitate connection with said mating electrical connector.

8. A composite clamping shell for electric cigar lighters as claimed in claim 6, wherein said spade lug has a central aperture for receiving a cooperable spring detent on the said mating electrical connector, such that the latter can interlock with the lug.

9. A composite clamping shell for electric cigar lighters as claimed in claim 6, wherein said spade lug has beveled corners, and a central aperture, said sheet-metal body being formed by stamping out a substantially flat blank of material, the configuration for said beveled corners and central aperture being formed at the same time that said stamping occurs.

10. A composite clamping shell for electric cigar lighters as claimed in claim 1, and further including a spade lug integral with said sheet-metal body, said spade lug comprising a double thickness of sheet metal, providing two layers of superposed material, the inner layer being sandwiched between the outer layer and the said annular out-turned flange of the drawn, sheet-metal sleeve and being in intimate engagement therewith, to provide added stiffness to said lug.

11. A composite clamping shell for electric cigar lighters as claimed in claim 1, wherein said stop shoulders comprise inwardly lanced protruding lugs, struck from the walls of the tubular sheet-metal body.

12. A composite clamping shell for electric cigar lighters as claimed in claim 11, wherein said sheet-metal body is formed by stamping out a substantially flat blank of material, said lugs being formed in the flat blank, prior to its being rolled into said tubular configuration.

13. A composite clamping shell for electric cigar lighters as claimed in claim 11, wherein said lugs are five in number.

14. A composite clamping shell for electric cigar lighters as claimed in claim 1, wherein the laid-over edge portions of the said one end of the sheet-metal body are dimpled at a number of circumferentially spaced locations, so as to more tightly engage the said out-turned flange of the drawn, sheet-metal sleeve, thereby preventing relative rotation between said body and said sleeve.

15. A composite clamping shell for electric cigar lighters as claimed in claim 14, wherein said dimpled locations are eight in number, and are substantially equally spaced circumferentially about the periphery of the said edge portions.

16. A composite clamping shell for electric cigar lighters as claimed in claim 1, and further including an electrical connector comprising a spade lug integrally formed with the remainder of said rolled sheet-metal body, for connection with a mating electrical connector of an automobile electrical system, the edge portions of the one end of said sheet-metal body having cut-outs on opposite sides of said spade lug, to provide clearance therefor when the edge portions are laid over the flange of the threaded sleeve.

17. A composite clamping shell for electric cigar lighters as claimed in claim 4, wherein said rolled sheet-metal body has a plurality of longitudinal stiffening ribs circumferentially spaced about its periphery, said stiffening ribs being formed at the time that the rolled body is in a substantially flat condition.

18. A composite clamping shell for electric cigar lighters as claimed in claim 1, wherein said rolled sheet-metal body has a series of apertures adapted to receive and retain a housing for carrying an electric light adapted to facilitate re-insertion of the plug into the socket.

19. A composite clamping shell for electric cigar lighters as claimed in claim 1, wherein the edge of said one end of the sheet-metal body has relieved areas adjacent the location of said seam, so as to not interfere with the laying over of the same on the flange of the threaded sleeve.

20. A composite clamping shell for electric cigar lighters as claimed in claim 6, wherein the inner layer of said spade lug is disposed inwardly toward the axis of the body, such that it can engage the out-turned flange of the sleeve, said engagement providing support to the inner layer of the lug, and minimizing the tendency for the lug to become inadvertently bent.

21. A composite clamping shell for electric cigar lighters as claimed in claim 20, wherein the said inner layer of the lug lies generally within the same cylindrical surface as the rolled body.

22. A composite clamping shell for electric cigar lighters as claimed in claim 20, wherein the outer layer of said lug is joined to the remainder of the body at a location defined by a shoulder having reverse bends, said outer layer being disposed outside of the cylindrical surface of the said body.

23. A composite clamping shell for electric cigar lighters as claimed in claim 1, wherein said stop shoulder are lanced from the body.

24. A composite clamping shell for electric cigar lighters as claimed in claim 1, wherein substantially all parts of said clinched seam lie within the cylindrical surface formed by the rolled sheet-metal body, so as to present a smooth exterior.

25. A composite clamping shell for electric cigar lighters, comprising in combination a rolled sheet-metal body of tubular configuration, having

an open end adapted to engage the rear surface of an apertured panel in an automobile, adjacent the location of a mounting flange for a threaded cigar lighter socket, a sheet metal sleeve of 5 annular configuration, having a screw thread in its wall, cooperable means joining said sheet metal sleeve to the other end of the sheet-metal body, and for preventing relative rotation between the two parts such that the sleeve thread can mate 10 with the cooperable thread on the cigar lighter socket and thereby hold the latter captive in the aperture of said panel, and an electrically conductive spade lug integral with the sheet-metal body so as to be at substantially the same 15 electrical potential thereof at all times, said spade lug being adapted for connection to a cooperable electrical connector of the electrical system of an automobile for carrying electrical current between said electrical system and said cigar lighter 20 socket.

26. The method of making a composite clamping shell for an electric cigar lighter, which comprises the steps of blanking out a flat substantially rectangular blank from commercial 25 grade sheet metal, laterally displacing a plurality of stop-shoulder portions along and spaced inwardly from one end of the blank, rolling the blank into a cylindrical shape and forming the adjoining edges into an interlocking, tightly 30 crimped seam to secure said edges to each other, deep-drawing a sheet metal shell of annular configuration and having an out-turned annular flange at one end, rolling a thread in the walls of said shell, placing the flange of the shell into one 35 end of the cylindrically-shaped blank against the stop-shoulder portions thereof, and laying over onto said flange, edge portions of the said one end of the cylindrically-shaped blank to secure the threaded shell thereto.

40 27. The method as claimed in claim 26, including the further step of dimpling the laid-over edge portions of the cylindrically-shaped blank so as to deform the same and cause tighter engagement of the dimpled portions with the out-turned flange of the drawn sheet metal shell.

28. The method as claimed in claim 26, and including the further step of imparting a series of longitudinal stiffening ribs to the rectangular blank prior to rolling the same into the cylindrical 50 shape.

29. The method as claimed in claim 26, and including the further step of blanking out a projection formable into a spade lug, prior to rolling the rectangular blank into the cylindrical 55 shape.

30. The method as claimed in claim 26, and including the further step of punching out of the rectangular blank a series of protruding lugs formable into stop shoulders, prior to rolling the 60 rectangular blank into the cylindrical shape.

31. The method as claimed in claim 29, and including the further step of folding the said projection back upon itself so as to form said 65 spade lug, said lug being constituted as a double layer of material.

32. The method as claimed in claim 29, and including the further step of punching out a pair of apertures in said projection, such that when the latter is formed into the said spade lug, said 70 apertures will overlie one another and receive a detent on a cooperable electrical connector of the automobile electrical system.

33. The method as claimed in claim 29, and including the further step of punching a pair of 75 notches on opposite sides of said projection, to facilitate bending of the end portion of the same back upon itself, said notches forming bevelled corners of the spade lug, following formation of the same.

34. The method as claimed in claim 29, and including the further step of forming a plurality of apertures in the blank, to receive a housing for an electric light prior to rolling the blank into the cylindrical shape.

35. A composite clamping shell for electric cigar lighters as claimed in claim 5, wherein said spade lug is preplated on both sides.

36. A composite clamping shell for electric cigar lighters as claimed in claim 1, wherein one 90 of said stop shoulders comprises an end portion of the reverse-bend clinched seam.

37. A composite clamping shell for electric cigar lighters as claimed in claim 10, wherein said sheet metal body has a recess adjacent the 95 location of said spade lug such that the said inner layer can nest in said recess and be sandwiched between the wall thereof and the out-turned flange of the sheet-metal sleeve.

38. A composite clamping shell for electric 100 cigar lighters as claimed in claim 37, wherein said recess is imparted to the body when it is in a substantially flat condition.

39. A composite clamping shell for electric cigar lighters as claimed in claim 36, wherein 105 substantially all parts of said end portion lie within the cylindrical surface formed by the tubular sheet metal body.

40. The method as claimed in claim 29, wherein said projection is formable into a double 110 layer spade lug, and including the further step of forming a recess in the body adjacent the location of the projection prior to rolling the rectangular blank into the cylindrical shape, such that after assembly of the shell and cylindrically-shaped 115 blank is effected, the inner layer of the lug nests in the recess and is sandwiched between the outer layer thereof and the laid-over edge portions of the said one end of the cylindrically shaped blank.

41. A composite clamping shell for electric 120 cigar lighters as claimed in claim 1, wherein said body and sleeve are formed of sheet metal stock, preplated on both sides.

42. A composite clamping shell for electric cigar lighters substantially as hereinbefore 125 described and with reference to the accompanying drawings.

43. A method of making a composite clamping shell for electric cigar lighters substantially as

hereinbefore described and with reference to the accompanying drawings.

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